

CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

- 1 1. An internet service provider (ISP) network comprising:
2 a plurality of routers connected to provide an internet protocol network (IP);
3 a first router, of said plurality of routers, in communication with an internet
4 application, said internet application having a first IP address;
5 a black-hole router in communication with said plurality of routers, said black-
6 hole router adapted to have a bogus IP address that is the same as said first IP address, said
7 bogus IP address having a higher preference than said first IP address;
8 wherein either one of said plurality of routers or said black-hole router is
9 adapted to inject a black-hole route scheme into a dynamic routing protocol used by said ISP
10 network such that selected ones of said plurality of routers route traffic to said bogus address
11 of said black-hole router.
- 1 2. The ISP network of claim 1, wherein said dynamic routing protocol is Boarder
2 Gateway Protocol (BGP).
- 1 3. The ISP network of claim 1, wherein said black-hole route is injected when
2 said internet application is under a Distributed Denial of Service (DDoS) attack.
- 1 4. The ISP network of claim 1, wherein said selected ones of said plurality of
2 routers route traffic to said bogus address via a consistent scheme.

- 1 5. The ISP network of claim 1, wherein said selected ones of said plurality of
- 2 routers can be changed in real-time by injecting a new black-hole route scheme into said
- 3 dynamic routing protocol.

1 6. An internet service provider (ISP) network comprising:
2 a first router in communication with said ISP network;
3 an internet application, having a first IP address, in communication with said
4 first router, said first router directing internet traffic to said first IP address of said internet
5 application; and
6 a second router, adapted to be a black-hole router, in communication with said
7 ISP network, said second router adapted to receive internet traffic that was originally
8 addressed to said first IP address, but was re-routed through predetermined routers within
9 said ISP network, said predetermined routers being less than all the routers in said ISP
10 network.

1 7. The ISP network of claim 6, further comprising a third router in
2 communication with said ISP network, said third router adapted to use an Interior Gateway
3 Protocol (IGP) to inject a black-hole address, which is the same as the first IP address, but
4 with a higher preference, into at least said predetermined routers within said ISP network
5 such that internet traffic originally addressed to said first IP address and routed through said
6 predetermined routers is redirected to said second router.

1 8. The ISP network of claim 6, wherein said internet traffic originally addressed
2 to said first IP address, but rerouted through predetermined routers comprises possibly both
3 attack traffic and legitimate traffic.

1 9. The ISP network of claim 6, wherein said attack traffic comprises possibly
2 but not limited to PING or SYN messages.

1 10. The ISP network of claim 8, wherein said internet traffic addressed to said first
2 IP address, but rerouted through predetermined routers comprises possibly both attack traffic
3 and legitimate traffic.

1 11. The ISP network of claim 6, wherein said predetermined routers create
2 consistent routing to said second router.

1 12. A method of black-holing internet traffic in an ISP network, said method
2 comprising:
3 injecting, by a first router, an instruction into said ISP network;
4 responding to said instruction, by a plurality of routers within said ISP
5 network, such that a first number of routers become black-holing routers and a second
6 number of routers become non-black-holing routers;
7 routing internet traffic addressed for a first IP address, by said non-black-
8 holing routers, to an internet application having said first IP address; and
9 routing internet traffic addressed for said first IP address, by said black-holing
10 routers, to a black-hole router having said first IP address.

1 13. The method of claim 12, wherein said instruction is a dynamic routing
2 protocol instruction.

1 14. The method of claim 12, wherein said instruction provides a black-holing
2 route injected into a Boarder Gateway Protocol (BGP).

1 15. The method of claim 12, wherein each said black-holing router provides said
2 internet traffic, routed toward said black-hole router, to a next-hop black-holing router.

1 16. The method of claim 12, further comprising, changing the number of said first
2 number of routers and said second number of routers in real-time.

1 17. The method of claim 12, wherein the route to said black-hole router having
2 said first IP address has a higher preference when compared to the preference of the route to
3 said internet application having said first IP address.

1 18. The method of claim 12, wherein said steps of routing internet traffic on the
2 router to said black-hole router is consistent routing.

1 19. The method of claim 18, wherein consistent routing requires that a black-
2 holing router in said ISP network routes traffic having said first IP address to other black-
3 holing routers and wherein non-black-holing router routes said first IP address to other non-
4 black-holing routers.